

REMARKS

Reexamination and reconsideration of claims 1-5 and 7-11, and consideration of new claims 12-15, are respectfully requested. Claim 6 has been cancelled. Moreover, the indication of allowable subject matter in claims 2-4, subject to the rejection under 35 U.S.C. sec. 112, second paragraph, is acknowledged with appreciation. The Primary Examiner's consideration of the Information Disclosure Statement (IDS) is acknowledged with appreciation. Additionally, Applicants include an IDS herewith for consideration of the U.S. patents listed on p. 14 of the present application.

The drawings were objected to under 37 C.F.R. 1.83(a) for not showing every feature of the invention specified in the claims. Proposed new Figs. 2 and 2a schematically illustrate a portion of a fiber optic cable system having optical connections between a first and a second fiber optic cable. No new matter has been added. Additionally, the specification has been amended to refer to new Fig. 2. Withdrawal of the objection to the drawings is respectfully requested.

Claims 1-7 and 9-11 were rejected under 35 U.S.C. sec. 112, second paragraph, as being indefinite. Claims 1, 5, 9, 10, and 11 recite inner and outer buffer tube layers each comprising a respective helix value. One skilled in the art would have understood that the respective helix value for the buffer tube layer would be calculated using an equation similar to equation (1) on p. 7 of the present application, except that the values used in the equation would be for the buffer tube layer instead of for an optical fiber. Claim 4 has been amended to remove any indefiniteness that may have existed. Dependent claim 6 has been cancelled without prejudice.

Additionally, Applicants assert that the Office Action misinterpreted the terms "substantially equal helix value" and "substantially non-equal helix value." The specification recites

10/035,769

A1091

Page 5

that the helix value(s) for at least two layers of buffer tubes can be made substantially the same, for example, within about 0% to 2% or 0% to 5% of each other. Likewise, non-equal helix values for each layer are given as a percentage of each other. See the present application at pp. 9-10, ll. 28-5. In other words, the percentages are percentages that are relative to the other layer(s). On the other hand, the interpretation of the phrases given in the Office Action states that a helix value of 0% results in a straight cable. This interpretation is incorrect. Applicants assert that the phrases should be given their meaning as used in the application, rather than as misinterpreted in the Office Action. Withdrawal of the sec. 112 rejection, second paragraph, of claims 1-7 and 9-11 is respectfully requested.

Claims 1 and 9 were rejected under 35 U.S.C. sec. 102(b) applying U.S. Pat. No. 5,343,549 ('549). The '549 patent discloses a fiber optic cable having a cable outer jacket and the coating on a central member made from a flame resistant plastic material. See the Abstract of the '549 patent. Additionally, the '549 patent states "two layers of buffer tubes are stranded with reverse oscillating lay around coated central member 1,2." See the '549 patent at Col. 1, ll. 54-56. For a patent to be applicable under sec. 102(b), the patent must, *inter alia*, disclose each and every feature of the claimed invention.

Claim 1 recites a fiber optic cable including optical fibers disposed in buffer tubes, the buffer tubes defining at least two layers generally stranded about a center area of the cable, the buffer tube layers defining a relatively inner layer of buffer tubes being closer to the center area, and an outer layer of buffer tubes being relatively further from the center area, the inner and outer buffer tube layers each comprising a respective helix value, the respective helix values being substantially the same.

---

10/035,769

A1091

Page 6

Claim 9 recites a fiber optic cable including optical fibers disposed in buffer tubes, the buffer tubes defining at least two layers generally stranded about a center area of the cable, the buffer tube layers defining a relatively inner layer of buffer tubes being closer to the center area, and an outer layer of buffer tubes being relatively further from the center area, the inner and outer buffer tube layers each comprising a respective helix value, the respective helix values being substantially non-equal.

It is respectfully submitted that at least each and every feature of claims 1 and 9 are not disclosed, taught, or otherwise suggested either explicitly, or inherently, by the '549 patent. The Office Action states that the '549 patent "discloses a cable with two layers of tubes and the tubes are would [sic] in a helix form. Both the tube layers have helix value or factor, which is substantially the same." See p. 5 of the Office Action dated March 3, 2003. However, the Office Action does not cite any text to support this assertion.

Rather, Applicants assert that the '549 patent merely states that the "two layers of buffer tubes are stranded with reverse oscillating lay around coated central member 1,2." See the '549 patent at Col. 1, ll. 54-56. This statement does not disclose, teach, or otherwise suggest the present invention.

Specifically, the '549 patent does not disclose, teach, or otherwise suggest a helix value for the layers of buffer tubes that are substantially the same. Nor is the '549 patent directed to a dispersion managed cable system (DMCS). The '549 patent merely discloses that the buffer tubes are stranded with reverse oscillating lay. On the other hand, claim 1 recites, *inter alia*, the inner and outer buffer tube layers each comprising a respective helix value, the respective helix values being substantially the same. Whereas, claim 9 recites, *inter alia*, that the inner and outer buffer tube layers each comprising a

respective helix value, the respective helix values being substantially non-equal. For at least these reasons, withdrawal of the sec. 102(b) rejection of claims 1 and 9 is warranted and is respectfully requested.

Claims 5-8, 10, and 11 were rejected under 35 U.S.C. sec. 103(a) applying the '549 patent in view of U.S. Pat. No. 5,611,016 ('016). The '016 patent discloses a dispersion-balanced optical cable that reduces four-photon mixing in Wave Division Multiplexing (WDM) systems. See the Abstract of the '016 patent. For patents to be applicable under sec. 103(a), the combination of teachings must, *inter alia*, expressly or inherently, teach, disclose, or suggest each and every feature of the claimed invention. Additionally, motivation and suggestion to combine the patents must be present.

The sec. 103(a) rejection of claims 5 and 7 is respectfully traversed for at least the reasons stated above with respect to claims 1.

Claim 8 recites a fiber optic cable system including one or more concatenated cables with at least one cable section having multiple layers of buffer tubes, at least some of the concatenated fibers in the system having essentially the same overall fiber length.

Claim 10 recites a fiber optic cable system including first and second fiber optic cables, each of the first and second fiber optic cables having respective optical fibers disposed in buffer tubes, the buffer tubes defining at least two layers respectively in the cables generally stranded about center areas of the respective fiber optic cables, the buffer tube layers defining a relatively inner layer of buffer tubes being closer to the center area, and an outer layer of buffer tubes being relatively further from the center area, the inner and outer buffer tube layers each comprising a respective helix value, the respective helix values within each cable being substantially non-equal, and the

respective helix values in the second fiber optic cable having the respective helix values such that at least some of the optical fibers in the overall fiber optic cable system have concatenated fiber lengths being essentially equal, when layers of buffer tubes of the first optical fiber cable are optically interconnected to a corresponding layer of buffer tubes of the second fiber optic cable.

Claim 11 recites a fiber optic cable system with some or all fibers having essentially the same length including first and second fiber optic cables, each of the first and second fiber optic cables having respective optical fibers disposed in buffer tubes, the buffer tubes defining at least two layers respectively in the cables generally stranded about a center area of the respective fiber optic cables, the buffer tube layers defining a relatively inner layer of buffer tubes being closer to the center area, and an outer layer of buffer tubes being relatively further from the center area, the inner and outer buffer tube layers each comprising a respective helix value, the respective helix values within each cable being substantially non-equal, and the layer of buffer tubes of the first optical fiber cable being optically connected to a non-corresponding layer of buffer tubes of the second fiber optic cable.

It is respectfully submitted that the applied art, taken alone or in combination with the other art of record, does not implicitly or expressly teach, disclose, or suggest all of the features of claims 8, 10, and 11. The skilled artisan would have understood that the outer layer of tubes in the '549 patent are located radially outward of the first layer of tubes. See Fig. 1 of the '549 patent. Thus, because the outer layer is located at a greater radial distance, the outer layer would have a longer length than the inner layer of tubes over the length of the cable. Consequently, the optical fibers within the outer layer of tubes would necessarily be longer than the optical fibers

within the inner layer of tubes over a cable system.

On the other hand, claim 8 recites, *inter alia*, one or more concatenated cables with at least one cable section having multiple layers of buffer tubes, at least some of the concatenated fibers in the system having essentially the same overall fiber length. Claim 10 recites, *inter alia*, that the respective helix values within each cable are substantially non-equal, and the respective helix values in the second fiber optic cable having the respective helix values such that at least some of the optical fibers in the overall fiber optic cable system have concatenated fiber lengths being essentially equal, when layers of buffer tubes of the first optical fiber cable are optically interconnected to a corresponding layer of buffer tubes of the second fiber optic cable. Claim 11 recites, *inter alia*, a fiber optic cable system with some or all fibers having essentially the same length. Because the combination of references does not teach each and every feature of claims 8, 10, and 11, the Office Action failed to make a *prima facie* case of obviousness. For at least these reasons, withdrawal of the sec. 103(a) rejection of claims 8, 10, and 11 is warranted and is respectfully requested.

Two-hundred and sixty four dollars (\$264.00) are believed due in connection with this Reply. Eighty-four dollars (\$84.00) are believed due in connection with this Reply for one new independent claim in excess of three and three dependent claims, added in this Reply, for a total of fourteen pending claims. (A total of 7 independent and 7 dependent claims are pending.) Additionally, one-hundred and eighty dollars (\$180.00) are due for the Information Disclosure Statement. If any other fees are due in connection with this Reply, please charge any fees, or credit any overpayment, to Deposit Account Number 19-2167.

Allowance of all pending claims is believed to be warranted and is respectfully requested.

The Examiner is welcomed to telephone the undersigned to discuss the merits of this patent application.

Respectfully submitted,

Michael E. Carroll, Jr.  
Michael E. Carroll, Jr.  
Attorney  
Reg. No. 46,602  
P.O. Box 489  
Hickory, N. C. 28603  
Telephone: 828/901-6725

Date: May 13, 2003

FAX RECEIVED

MAY 14 2003

TECHNOLOGY CENTER 2800

*original for consistency*

VERSION WITH MARKINGS TO SHOW CHANGES MADEIN THE SPECIFICATION:

After the paragraph ending at page 4, line 18 insert the following:

Figures 2 and 2a are schematic representations of a portion of respective fiber optic cable systems having an optical connection between optical fibers of a first cable and a second cable.

The two successive paragraphs beginning at page 12, line 19 have been amended as follows:

Fiber optic cables according to the present invention can be optically interconnected by, for example, fusion splicing, defining a cable system. In one system embodiment, concatenated cables have minimum variation in fiber length without the need to do cross splicing between inner and outer layers of buffer tubes of the respective cables, thereby minimizing differential fiber length (Figure 2). Layers of buffer tubes having like helix values have at least some of their respective optical fibers optically [are] interconnected. In other words, the fiber optic cable system has first 10 and second 10' fiber optic cables, each of the first 10 and second 10' fiber optic cables having respective optical fibers 15, 15', 19, 19' that are disposed in respective buffer tubes 14, 14', 18, 18'. The buffer tubes defining at least two layers respectively in the cables, and are generally stranded about center areas of the respective fiber optic cables. The buffer tube layers define a relatively inner layer of buffer tubes closer to the center area, and an outer layer of buffer tubes being relatively further from the center area. The inner and outer buffer tube layers each define a respective helix value, the respective helix values within each cable can be substantially the same; and the layer of buffer

---

10/035,769

A1091

Page 12



tubes having optical fibers of the first optical fiber cable is optically connected to a corresponding layer of buffer tubes having optical fibers of the second fiber optic cable, e.g., by fusion splicing. For example, optical fibers 15 of inner layer 14 [layers] can be optically connected to optical fibers 15' of inner layer 14' [layers] from cable 10 to cable 10'.

Other balanced cable systems are possible as well. For example, where the respective helix values within each of the cables are substantially non-equal, and the layer of buffer tubes having optical fibers of the first optical fiber cable 10 are optically connected to a non-corresponding layer of buffer tubes having optical fibers of the second fiber optic cable 10' (Figure 2a). For example, an outer layer of buffer tubes 18 of a first cable 10 can be connected to an inner layer of buffer tubes 14' of a second cable 10', and vice versa. The respective helix values are established to [be] as needed for the system requirements. Helix values of the interconnected layers can be substantially the same or non-equal.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

4. (amended) The fiber optic cable of claim 1, said buffer tube layers having relatively smaller buffer tube wall thicknesses [inner] or outer diameters occupying the inner tube layer.

Please cancel claim 6 without prejudice.

10/035,769

A1091

Page 14